

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
18 November 2004 (18.11.2004)

PCT

(10) International Publication Number
WO 2004/099500 A1

(51) International Patent Classification⁷: **D21H 23/56**,
19/66, 19/82, 27/26

(21) International Application Number:
PCT/EP2004/004222

(22) International Filing Date: 21 April 2004 (21.04.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
VR2003 A 000054 7 May 2003 (07.05.2003) IT

(71) Applicant (for all designated States except US):
CARTIERE FEDRIGONI E C. S.P.A. [IT/IT]; Strada
del Linfano, 16, I-38062 Arco (IT).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **FEDRIGONI,
Giuseppe** [IT/IT]; Corso Porta Nuova, 41, 37122 Verona
(IT).

(74) Agent: **MODIANO, Guido**; Modiano & Associati, Via
Meravigli, 16, IT-20123 Milano (IT).

(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,

AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,
KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,
MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG,
PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM,
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM,
ZW.

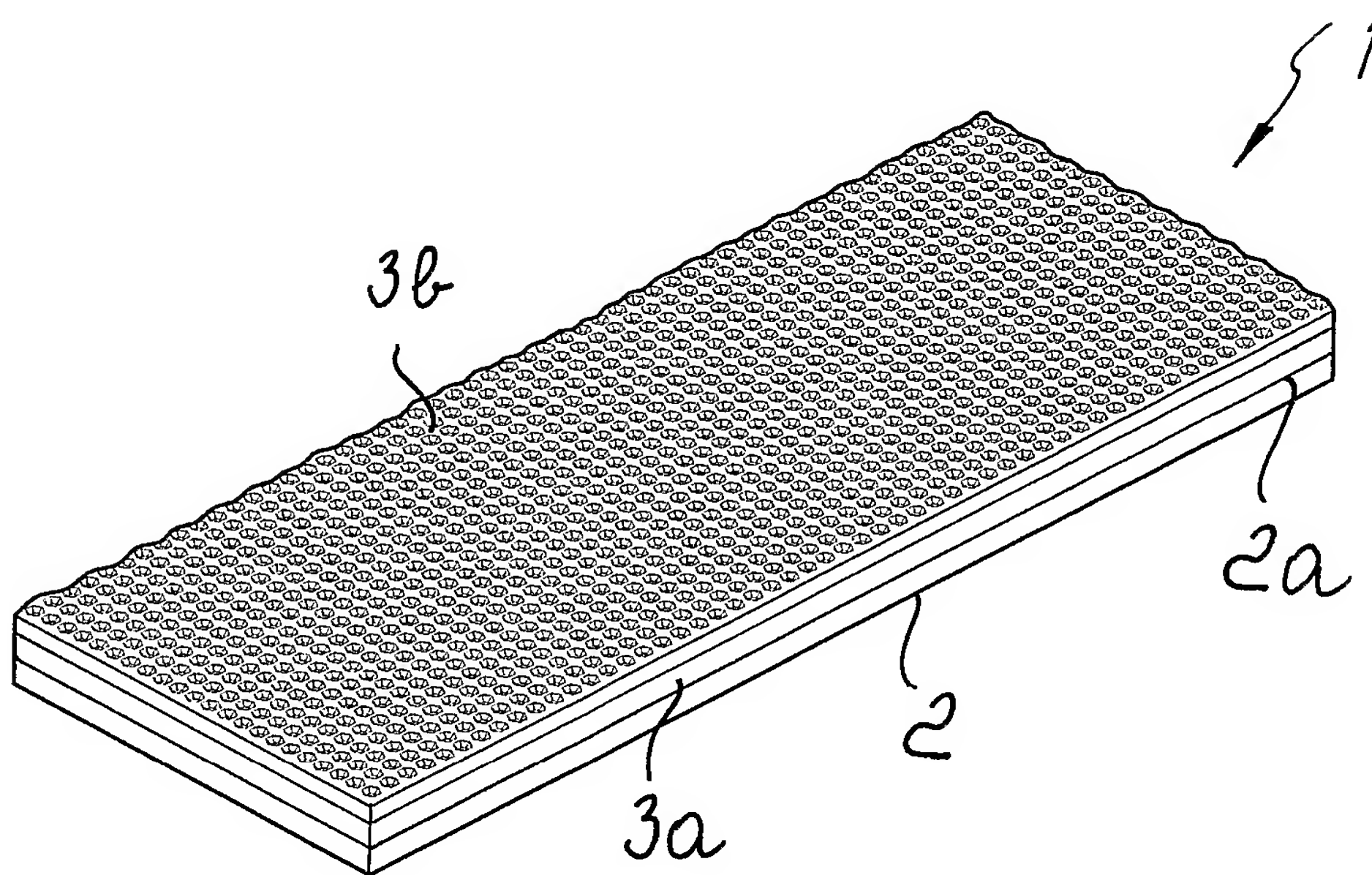
(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),
Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), Euro-
pean (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR,
GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK,
TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW,
ML, MR, NE, SN, TD, TG).

Published:

- with international search report
- before the expiration of the time limit for amending the
claims and to be republished in the event of receipt of
amendments

For two-letter codes and other abbreviations, refer to the "Guid-
ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.

(54) Title: METHOD FOR PRODUCING COATED PAPER WITH PEARLESCENT EFFECT



(57) Abstract: A method for producing coated paper with pearlescent effect, sequentially comprising the following operating steps:
-- a deposition, on at least one side (2a) of a paper medium (2), of at least one layer (3a) of coating; -- an additional deposition, over
the at least one layer (3a) of coating, of a coating (3b) with pearlescent effect by a rotogravure/flexographic device.

WO 2004/099500 A1

METHOD FOR PRODUCING COATED PAPER WITH PEARLESCENT EFFECT

Technical Field

The present invention relates to a method for producing coated paper
5 with pearlescent effect.

Background Art

Currently, coated papers are increasingly important in the graphic sector.

In particular, so-called ivory or embossed coated papers are rather
10 widespread and are produced by combining the traditional processes for producing coated papers with the methods for obtaining the so-called ivory or embossed effect.

However, currently it is not easy to obtain a coated paper with pearlescent effect by using conventional processes.

15 The pearlescent effect, according to current knowledge, can in fact be obtained either by depositing, by means of a stiff blade, the pearlescent pigments on the paper medium on which the coating has been spread beforehand, or by mixing the pearlescent pigments with the coating and then spreading the resulting mixture onto the paper medium.

20 However, it has been found that the products obtained with the methods described above are very poor.

The dimensions of the pearlescent pigments are in fact distinctly larger (by approximately ten times) than those of conventional coatings, and it is therefore practically impossible to obtain a uniform mixture.

25 Furthermore, in order to allow pearlescent pigments to express their characteristic effect, they must remain completely on the surface, whereas if they are mixed with the coating they also distribute proximate to the paper medium.

Finally, it should be noted that if the pearlescent pigments are
30 deposited by means of a stiff blade, since they are, as mentioned,

considerably larger than the pigments that constitute the coating, they form streaks and/or lines.

Disclosure of the Invention

The aim of the present invention is to provide a method for producing
5 coated paper with pearlescent effect that is capable of eliminating or in any case drastically reducing the drawbacks noted above of conventional methods.

Within this aim, an object of the invention is to provide a method for producing coated paper with pearlescent effect that allows to obtain a paper
10 with high printability.

Another object of the present invention is to provide a technological solution that allows to provide a range of coated papers with pearlescent (or slightly pearlescent) effect while maintaining a high brightness, so as to allow their use in the most disparate sectors, from graphics to packaging and
15 covering to advertising.

Another object of the invention is to provide a method for producing coated paper with pearlescent effect that allows to obtain coated papers with pearlescent effect on one or both sides of the paper medium.

This aim and these and other objects that will become better apparent
20 hereinafter are achieved by a method for producing coated paper with pearlescent effect, characterized in that it sequentially comprises the steps of:

- performing a first deposition, on at least one side of a paper medium, of at least one first layer of coating;
- 25 -- performing a second deposition, over the first layer of coating, of a coating with pearlescent effect by means of a rotogravure/flexographic device.

Advantageously the coating with pearlescent effect comprises at least nitrocellulose resins, mica-based pigments, and a solvent.

30 According to another aspect, the present invention provides a coated

paper with pearlescent effect, which is characterized in that it comprises a paper medium that has, at at least one side, at least one first layer of coating and, over the first layer of coating, at least one layer of coating having a pearlescent effect.

5 Brief Description of the Drawings

Further aspects and advantages of the invention will become better apparent from the present detailed description of some currently preferred examples of embodiments, given merely by way of non-limiting example with reference to the accompanying drawings, wherein:

10 Figure 1 is a perspective view of a coated paper with pearlescent effect according to the invention;

Figure 2 is a perspective view of a deposition cylinder;

Figure 3 is an enlarged-scale side elevation view of the outer surface of the deposition cylinder shown in Figure 2; and

15 Figure 4 is a sectional view, taken along the line IV-IV of Figure 3.

Ways of carrying out the Invention

In the examples of embodiments that follow, individual characteristics, given in relation to specific examples, may actually be interchanged with other different characteristics that exist in other examples
20 of embodiments.

Moreover, it is noted that anything found to be already known during the patenting process is understood not to be claimed and to be the subject of a disclaimer.

As shown by the figures, the present invention relates to a method for
25 producing coated paper having a pearlescent effect, generally designated by the reference numeral 1.

In particular, the production process according to the invention provides that at least one deposition of at least one layer 3a of coating is performed at at least one side 2a of a paper medium 2, first of all, by way of
30 per se known devices or systems.

Also according to the invention, the method for producing coated paper with pearlescent effect provides for an additional deposition of a pearlescent coating 3b over the coating layer 3a.

5 In particular, the additional deposition of pearlescent coating 3b is performed by using rotogravure (or flexographic) devices (or systems), constituted for example by a deposition roller 4, which has a plurality of deposition cells 5 at its outer side wall 4a.

10 In greater detail, a method for producing coated paper having a pearlescent effect, merely by way of example, can provide for a first deposition of a layer of conventional coating approximately 6-12 microns thick on both sides (2a and 2b) of a paper medium 2 that has a thickness of approximately 100 microns.

Then, according to a preferred embodiment, an additional layer of coating of approximately 1-8 microns per side is deposited on both sides.

15 It is evident that after these depositions (of "conventional" coating), the thickness of the medium will be approximately 116-140 microns.

According to the invention, a layer of pearlescent coating is then applied on one or both sides of the resulting medium by way of a system or device of the rotogravure/flexographic type, constituted for example by a
20 deposition roller 4.

By way of example, this deposition or these depositions of layers of pearlescent coating is(are) performed by placing the medium, or rather both faces of the medium, in contact with the outer side wall 4a of the deposition roller 4.

25 According to a preferred embodiment, the coating layer(s) containing the pearlescent pigments deposited by the deposition roller 4 has(have) a thickness of approximately 2-6 microns, which accordingly brings the total thickness of the resulting paper to 120-152 microns.

30 Naturally, nothing forbids the use of initial paper media of different thickness, or the deposition of thicknesses of coating (or pearlescent

coating) having thicknesses that differ from those indicated in the method described above.

Advantageously, the pearlescent coating comprises at least nitrocellulose resins, mica-based pigments, and a suitable solvent.

5 According to another aspect, the present invention provides a coated paper with pearlescent effect 1, which is constituted by a paper medium 2 that has, at at least one side 2a, at least one coating layer 3a and, above the coating layer 3a, at least one coating layer 3b with pearlescent effect.

10 All the characteristics of the invention described above as being advantageous, convenient or the like may also be omitted or replaced with equivalents.

All the details may further be replaced with other technically equivalent elements.

15 The materials and the dimensions may be various according to requirements.

The disclosures in Italian Patent Application No. VR2003A000054 from which this application claims priority are incorporated herein by reference.

CLAIMS

1. A method for producing coated paper with pearlescent effect, characterized in that it sequentially comprises the steps of:

- 5 -- performing a first deposition, on at least one side of a paper medium, of at least one layer of coating;
- performing a second deposition, over said at least one layer of coating, of a coating with pearlescent effect by means of a rotogravure/flexographic device.

2. The method for producing coated paper with pearlescent effect
10 according to claim 1, characterized in that said coating with pearlescent effect comprises at least nitrocellulose resins, mica-based pigments, and a solvent.

3. The method for producing coated paper with pearlescent effect, according to claim 1, characterized in that said rotogravure/flexographic
15 device comprises at least one deposition roller.

4. The method for producing coated paper with pearlescent effect according to claim 3, characterized in that said at least one deposition roller has a plurality of deposition cells at its outer side wall.

5. The method according to claim 1, characterized in that said paper
20 medium has a thickness comprised between 70 and 400 microns.

6. The method for producing coated paper with pearlescent effect according to claim 1, characterized in that said first deposition step comprises deposition of a first and second layers of coating, said first layer of coating having a thickness comprised between 6 and 12 microns, and said
25 second layer of coating having a thickness comprised between 1 and 8 microns.

7. The method for producing coated paper with pearlescent effect according to claim 6, characterized in that said deposition of said first and second layers of coating is performed at both sides of said paper medium.

30 8. The method for producing coated paper with pearlescent effect

according to claim 1, characterized in that said additional deposition of a coating with pearlescent effect is performed over both of said first depositions.

9. The method for producing coated paper with pearlescent effect
5 according to claim 1, characterized in that said additional deposition of a coating with pearlescent effect has a thickness comprised between 2 and 6 microns per side.

10. A coated paper with pearlescent effect, characterized in that it comprises a paper medium that has, at at least one side, at least one layer of
10 coating and, above said at least one layer of coating, at least one layer of coating with pearlescent effect.

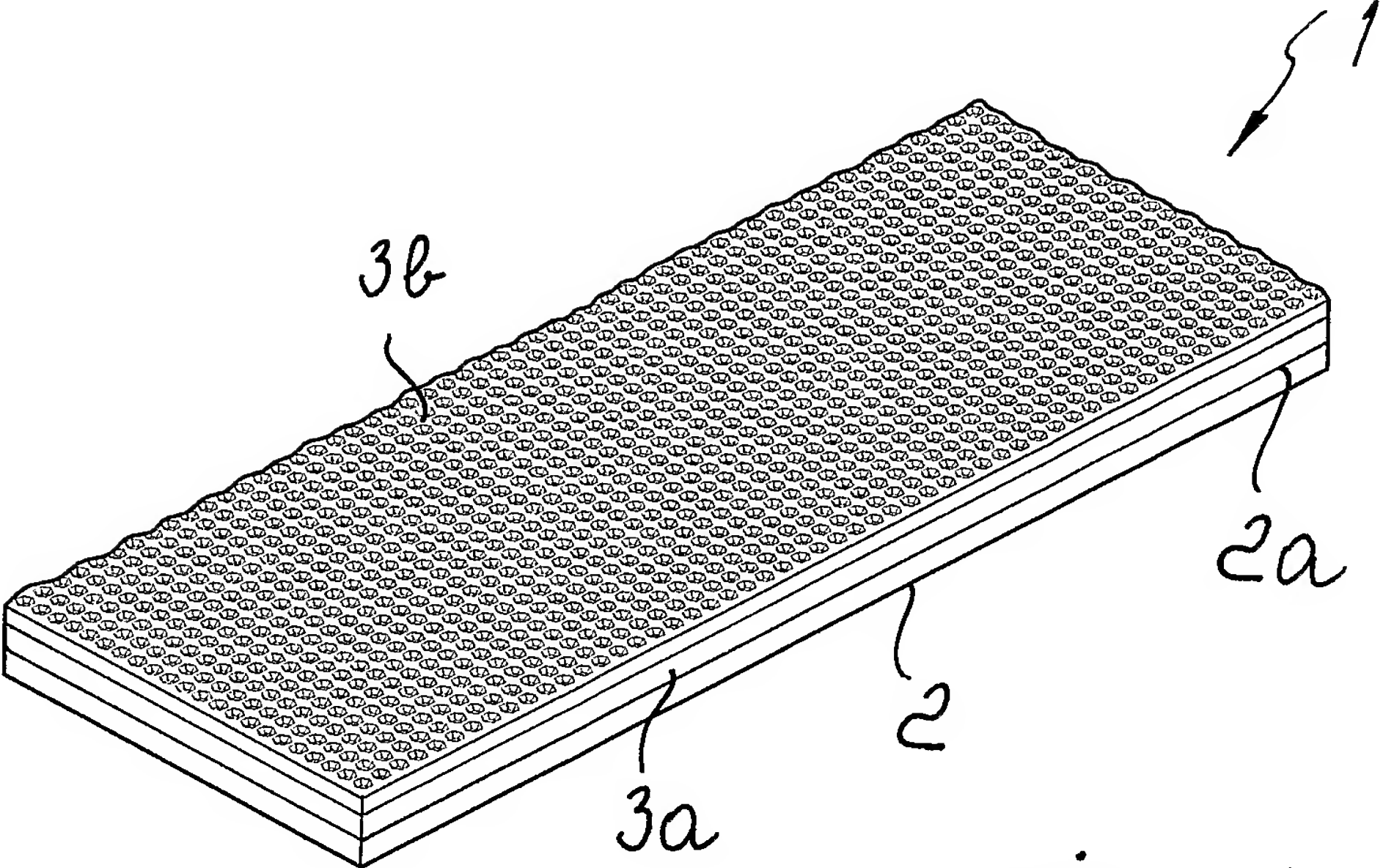


Fig. 1

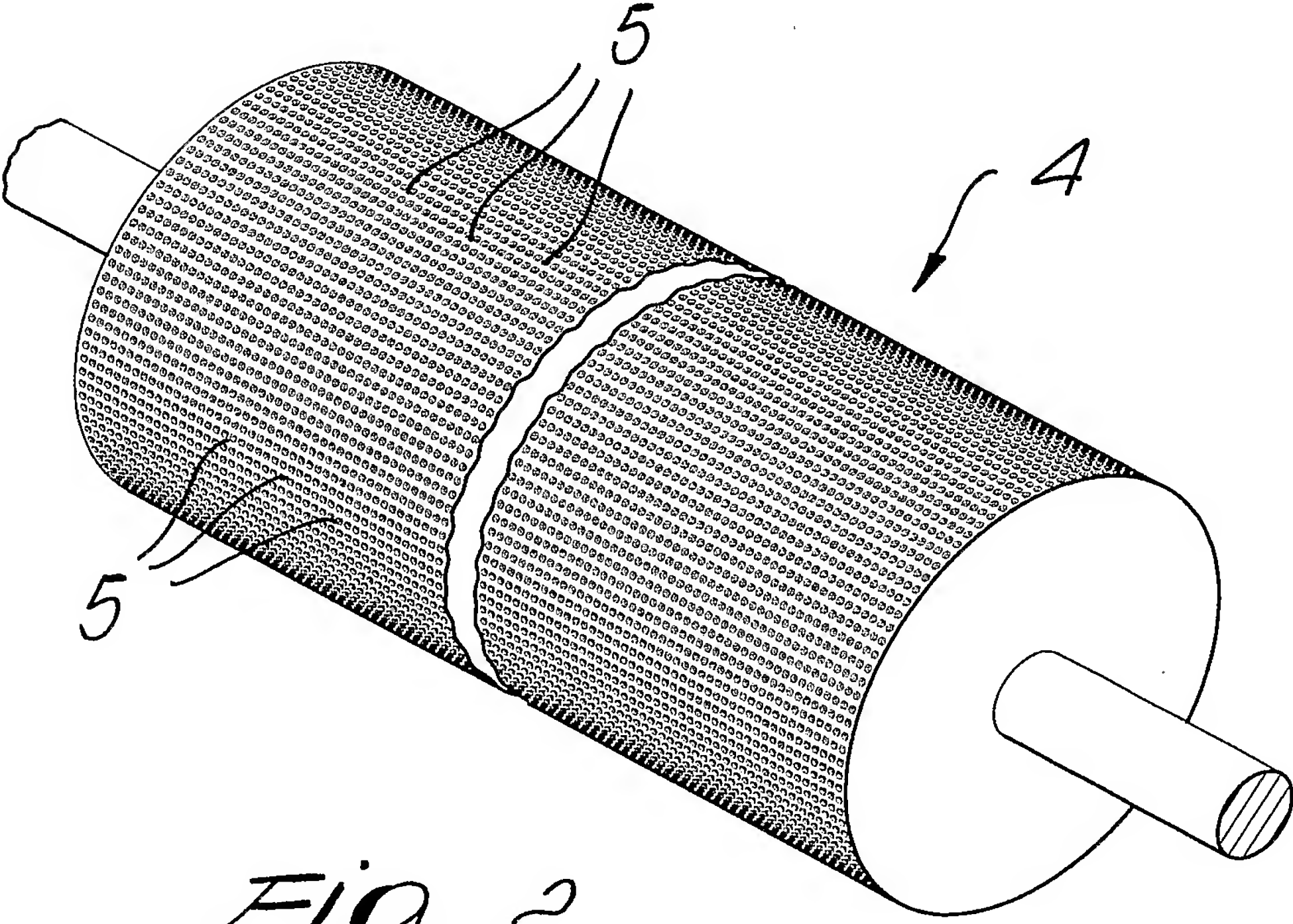


Fig. 2

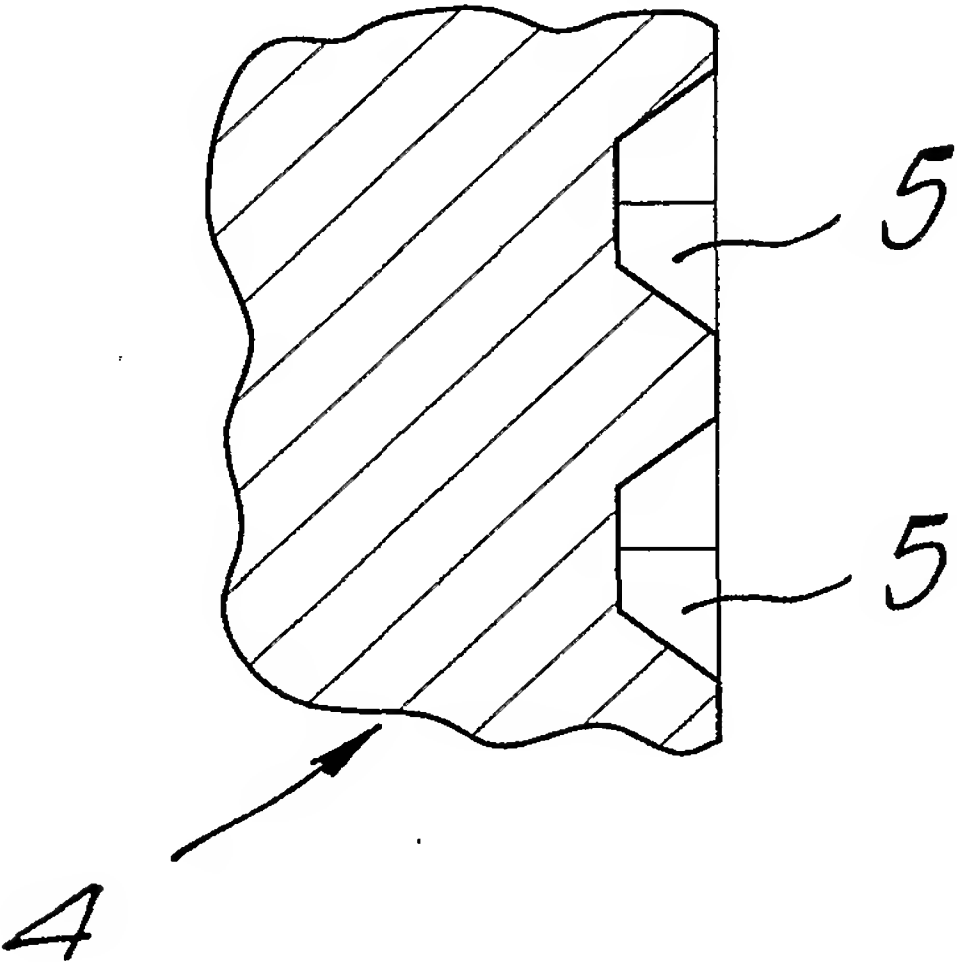
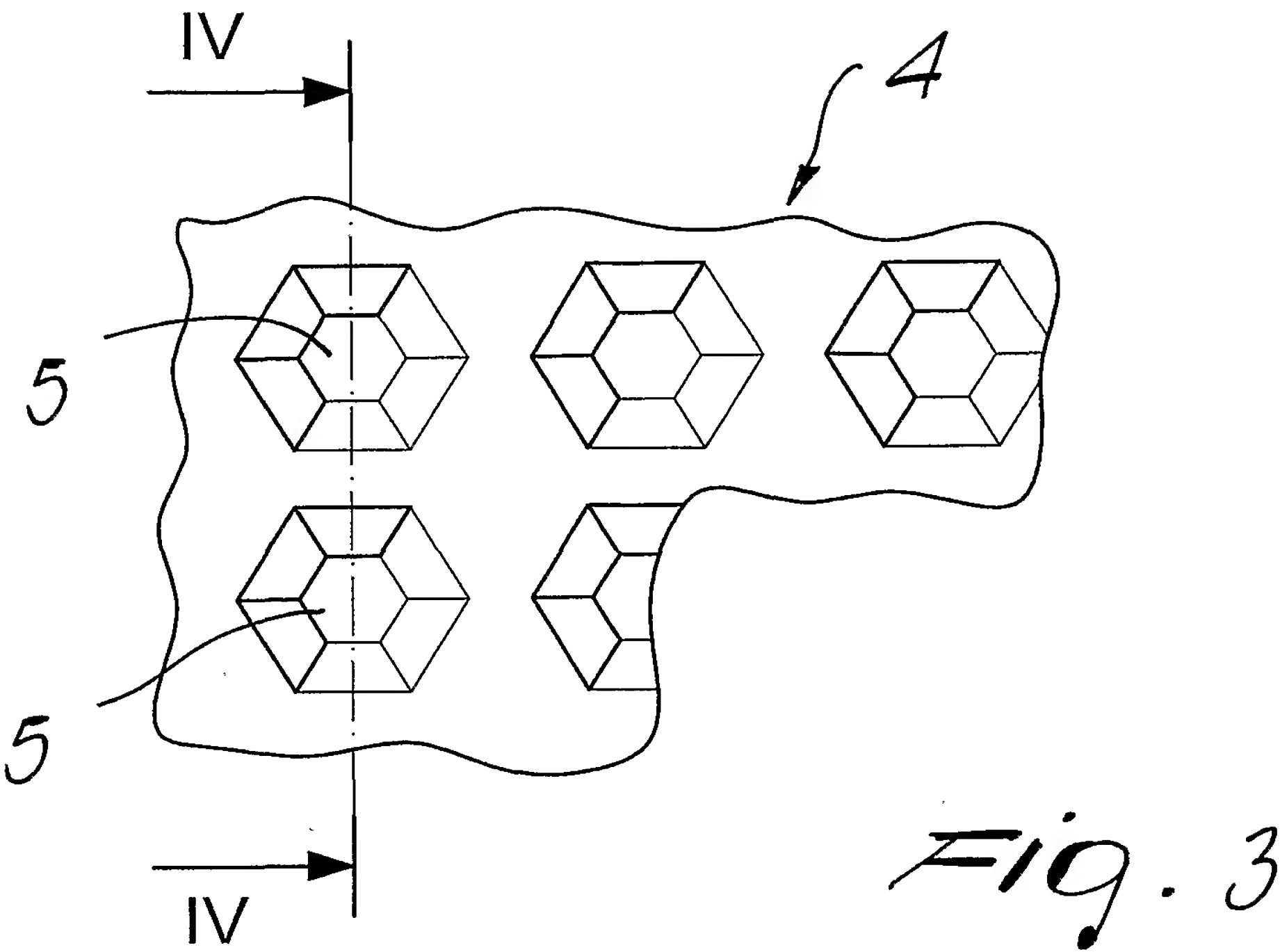


Fig. 4

INTERNATIONAL SEARCH REPORT

International Application No
PCT/EP2004/004222

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 D21H23/56 D21H19/66 D21H19/82 D21H27/26

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 D21H

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 409 280 A (WILEY JOHN W ET AL) 11 October 1983 (1983-10-11) figure 2 column 4, line 33 - line 49 column 5, line 17 - line 29 -----	1,10
X	WO 95/06568 A (NEVAMAR CORP) 9 March 1995 (1995-03-09) abstract figures 1,2 -----	10
X	US 5 571 557 A (DE BASTIANI NORMAN P ET AL) 5 November 1996 (1996-11-05) claims 1,2 column 1, line 43 - line 55 -----	1,2,10

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

° Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- * & * document member of the same patent family

Date of the actual completion of the international search

14 September 2004

Date of mailing of the international search report

24/09/2004

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Naeslund, P

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP2004/004222

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 4409280	A	11-10-1983	AU 552329 B2	29-05-1986
			AU 8770582 A	31-03-1983
			CA 1200443 A1	11-02-1986
			NZ 201638 A	21-02-1986
			US 4675212 A	23-06-1987
<hr/>				
WO 9506568	A	09-03-1995	US 5466511 A	14-11-1995
			AT 173437 T	15-12-1998
			AU 679565 B2	03-07-1997
			AU 7720194 A	22-03-1995
			BR 9407383 A	29-10-1996
			CA 2170905 A1	09-03-1995
			DE 9422233 U1	17-06-1999
			DE 69414713 D1	24-12-1998
			DE 69414713 T2	29-04-1999
			DK 716635 T3	02-08-1999
			EP 0716635 A1	19-06-1996
			ES 2124429 T3	01-02-1999
			JP 2935897 B2	16-08-1999
			JP 8512255 T	24-12-1996
			KR 175713 B1	01-04-1999
			NZ 273775 A	24-10-1997
			RU 2128263 C1	27-03-1999
			WO 9506568 A1	09-03-1995
			US 5866207 A	02-02-1999
			US 5866208 A	02-02-1999
			US 5866209 A	02-02-1999
			US 5807608 A	15-09-1998
<hr/>				
US 5571557	A	05-11-1996	NONE	
<hr/>				

PUB-NO: WO2004099500A1
DOCUMENT-IDENTIFIER: WO 2004099500 A1
TITLE: METHOD FOR
PRODUCING COATED
PAPER WITH
PEARLESCENT EFFECT
PUBN-DATE: November 18, 2004

INVENTOR-INFORMATION:

NAME	COUNTRY
FEDRIGONI, GIUSEPPE	IT

ASSIGNEE-INFORMATION:

NAME	COUNTRY
CARTIERE FEDRIGONI E C S P A	IT
FEDRIGONI GIUSEPPE	IT

APPL-NO: EP2004004222

APPL-DATE: April 21, 2004

PRIORITY-DATA: ITVR20030054A (May 7, 2003)

INT-CL (IPC): D21H023/56 , D21H019/66 ,
D21H019/82 , D21H027/26

EUR-CL (EPC): D21H019/66

ABSTRACT:

CHG DATE=20041130 STATUS=O>A method for producing coated paper with pearlescent effect, sequentially comprising the following operating steps: -- a deposition, on at least one side (2a) of a paper medium (2), of at least one layer (3a) of coating; -- an additional deposition, over the at least one layer (3a) of coating, of a coating (3b) with pearlescent effect by a rotogravure/flexographic device.